

Three Proposals for Improving Public Transportation in Berkeley

*RE
Motor bus lines - California - Berkeley
Local transit - " "*

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City of Berkeley Planning Department • August 1974

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FOREWORD

Many Berkeleyans have recognized for years the social and environmental necessity for improving transit in the City so that it would be possible for Berkeleyans to live full lives without having to use automobiles either at all, or nearly as much as at present. The Circulation Section of the Master Plan reflects this sentiment. In order to help attain this goal, the City of Berkeley, in cooperation with the University of California, the Berkeley Unified School District, the Metropolitan Transportation Commission, A.C. Transit, and BART was able to obtain a modest Federal grant to develop a plan for improving transit in Berkeley.

We of the City Planning Department are responsible for supervising consultants in the production of this plan. This report, prepared by us, presents to Berkeleyans the three proposals for improving transit in Berkeley which have been put together at this point. The work presented herein was conducted by the consulting firms of Wilbur Smith and Associates, and Curtis Associates, as well as ourselves. The three proposals we describe have been approved for evaluation by the Berkeley Transit Coordination Board.

We have not figured out how much each proposal would cost, or how well each would serve Berkeley residents and others. We will do this work during the evaluation, which is about to begin. As we do the evaluation, we will be listening to the comments and reactions of Berkeleyans, improving

upon the proposals and finally recommend what we think is the best one.

Why should you care about this project? Well, it is not just another study. We are trying to get some action on improved transit for Berkeley. If you ride the bus or BART now and think service could be better, if you would like to use transit but it isn't available or convenient, and if you wish more people would stay out of their cars, now is the time to get involved.

We certainly don't know all the answers, and perhaps we are not being bold enough. You may feel streetcars, trolley buses, cable cars or some other technology is the answer. Maybe you think the whole idea costs too much money. Let us know!

We want to hear as many viewpoints as possible before we recommend to City Council and the Planning Commission one program for improving public transportation in Berkeley.

We hope to hear from you,

Thomas F. Peak, Project Director

Gregory L. Thompson, Project
Coordinator

Berkeley City Planning Department
845-1865

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Summary

REASON FOR STUDY

"Street Widening" is a dirty phrase in Berkeley. It was proposed as the solution to the City's traffic problems during the mid-60's, causing a Berkeley citizens' revolt. As a consequence, the Planning Commission drafted, and Council adopted in 1969 a new Circulation Section to the Master Plan. The new section said in effect:

- 1) Major traffic on only certain streets so as to contain the bad effects of car travel;
- 2) But, no widening of those streets, so as not to encourage more and faster car travel, and so as not to eliminate the beauty of many Berkeley streets;
- 3) And, no freeways or similar new facilities, so as not to destroy the fabric of the City.

But, the streets designated to carry traffic were already choked with cars, and the pressure to close residential streets to through traffic threatened to place even more traffic on these major streets. Furthermore, the amount of travel done in Berkeley was increasing. So, the new section also said in effect: More and more people should travel without the aid of their automobile. This study to improve transit results from this Master Plan position.

In addition there are a large number of people who don't drive. Many of them use the existing transit system. Many others can't because it

doesn't provide them with the type of transportation they need, or because they are not physically able to use it. Another purpose of the study is to improve travel conditions for these people.

Thus, the purpose of this project is to recommend to the City Council and the regional Metropolitan Transportation Commission an improved transit service which would make it possible for many more Berkeleyans to lead a meaningful life without having to own an automobile, and which would make it possible for many others to leave their cars at home when they visit Berkeley.

WHY TRANSIT SHOULD BE IMPROVED

A.C. Transit operates clean, shiny buses, and it has succeeded in attracting large numbers of new patrons to its transbay services. BART should further this trend. However, today A.C. carries fewer passengers in its non-transbay service than the old Key System did during its last year and at the time everybody thought it (the Key System) had just about reached the bottom of the barrel. BART will likely make a contribution to handling long distance East Bay travel, but its contribution to handling East Bay local travel will be minimum. East Bay travel, almost all of which A.C. and BART do not attract, is many times larger than transbay travel. As a consequence, transit's share of total travel within the East Bay Area is negligible, and will likely continue to be without changes made to its composition.

Travel in Berkeley illustrates this point. A.C. carries up to 50% of all trips going to San Fran-

cisco from Berkeley, but accounts for only about 8% of all trips made within, to, and from Berkeley.

It would appear that we should make substantial changes to East Bay transit service, if we expect it to carry a significant amount of East Bay travel, particularly in Berkeley. Based on experience elsewhere, we feel that conventional transit should be able to accommodate 25 to 40% of all trips made in Berkeley, a significant increase over the 8% now carried. We can do this by continuing to provide good connections for Berkeleyans to outside points, while improving the quality of service for people traveling purely within Berkeley, and for people coming into Berkeley from the outside. That means that we want a transit service in Berkeley that would make many places in Berkeley (including BART stations and long-distance A.C. bus routes) reachable from all parts of Berkeley.

TRANSIT IMPROVEMENT FOR BERKELEY

Transit improvement in Berkeley should occur on several fronts: route structure, vehicle design, transit vehicle preference and fare policy, to name several. However, the key to transit improvement is where and when the routes go, and how they relate to each other. It really doesn't matter if the bus or trolley is dirty or clean, is the proper design, or if it is free; if it does not first go where a person wants to go (either directly, or via a convenient transfer) when he wants to go, he won't use it. Once it does go where and when a person wants to go, then it is time to start worrying about the other things.

Transit Routing Improvements

In Berkeley people want to go to the University more than any other single destination, but their travel to all other places combined is much larger than their travel to the University. So, it would seem desirable to have a transit service that would take people (both Berkeleyans and those entering the City by BART or A.C.) to many places in Berkeley, but do so particularly well to the University. One of the reasons that A.C. Transit has not done very well in Berkeley is that it is not systematically designed to carry people around to a large number of Berkeley destinations. Furthermore, the existing system design does not recognize the overwhelming importance of the University for attracting travel from within and without Berkeley.

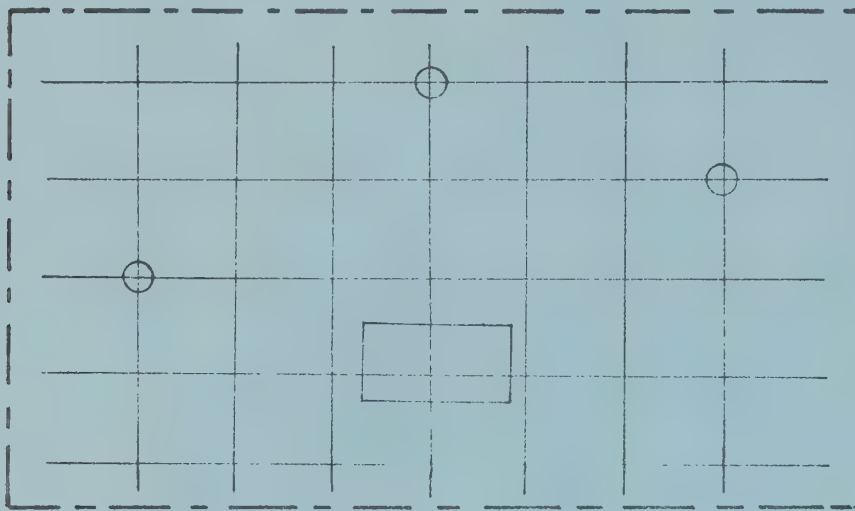
We have developed three proposals for improved transit routing in Berkeley. Two of the proposals use established and successful methods for making many different points reachable by transit. Proposal 1 uses the "grid" method of routing, which makes it possible for a person to get from any point in Berkeley to any other point by transferring once. Buses or trolleys must come often on every route so that transferring is easy. Proposal 2 uses the "timed transfer point" method of routing, which makes it possible to get to a large number of major destinations in Berkeley from all residential areas and outside points. This can be done by direct service, or via one "timed" transfer. The diagram in Figure 1 illustrates in simplified form the

FIGURE 1

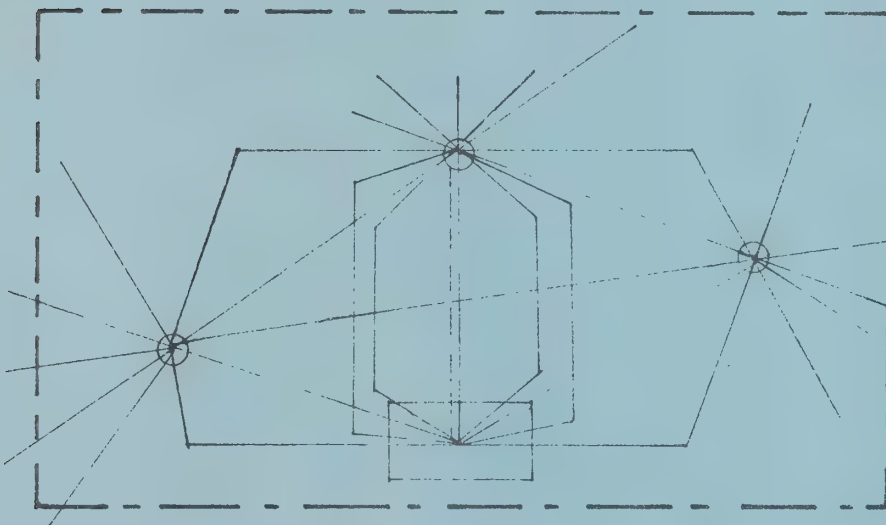
SCHEMATIC DRAWING COMPARISONS OF TRANSIT ROUTING METHODS

LEGEND:

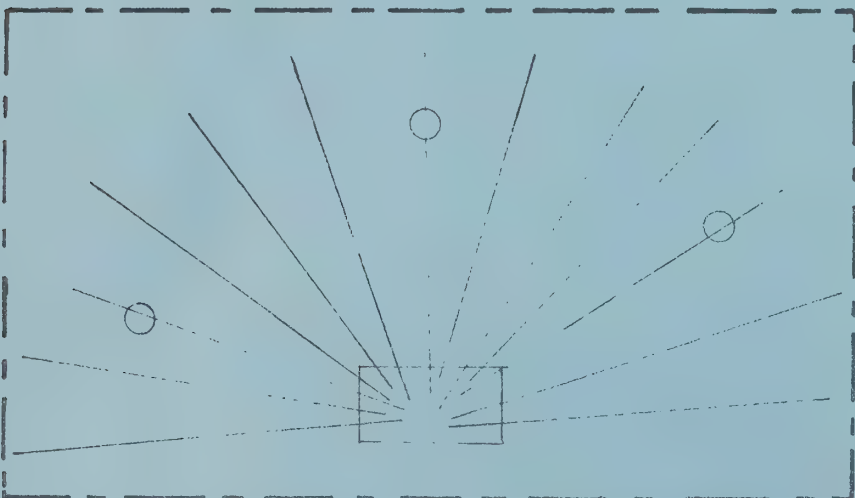
- Metro Area Boundary
- Transit Route
- Major Activity (i.e. — University or regional shopping center)
- C. B. D.



GRID (frequent service on all routes to make transferring easy)



TIMED TRANSFER
(buses or trains on all routes arrive at same time at main interseing points to make transferring easy)



CLASSIC RADIAL (buses or trains operate to C.B.D. as fast as possible)

essential differences between these two methods. It also contrasts these methods to the downtown-oriented classic radial routing method, on which existing A.C. Transit service is based.

The third proposal does not use systematic change, but instead makes more modest changes to the existing routes in an attempt to make many more Berkeley destinations easily reachable. We will evaluate these routing proposals to determine how much they will cost, how much travel they will attract, and what impact they will have on the City.

Other Aspects of Transit Improvement

Routing changes alone, however, will not be enough to attract a lot of new transit users. Once a person finds that he can get from where he is to where he wants to go in a fairly direct manner, he will start thinking about other things: how much it costs, how reliable it is, how cramped it is, how clean it is, and other factors. The following additional transit improvement aspects will also be considered:

Special Service for Disabled

One of the most important new features common to all proposals would be a set of approximately 10 small buses with hydraulic ramps for the use by disabled persons, both young and old. No matter how well a transit system is laid out, it cannot be used by a person unless he or she has the ability to walk. Because it appears infeasible to load and unload wheel-

chairs from regularly-scheduled buses* which should not dwell longer than a few seconds at any given stop, the special service is proposed. The 10 or more special buses would have a central dispatching service.

Bicycle Access to Transit

Bicycle access to transit services should also be encouraged. We do not feel that bicycles should be placed on board buses, but bicycles might be carried in special trailers or rear-mounted racks on sections of routes which traverse geographic barriers, such as the Bay or the hills. To that end, we propose that one hill route be equipped to carry bicycles as so described. In addition, BART's usefulness should be increased if people could safely store bicycles at BART stations. This safe storage should be free to the user. Finally, BART should carry bicycles during off-peak hours, as the London subway system does.

Vehicle Improvement

Better buses are needed. Some routes on all of the proposals should have smaller vehicles,

*It is possible that principal transit routes receiving special treatment could accommodate wheelchairs between certain stops, if those routes were redeveloped into modern, high-capacity streetcar lines with selective floor level platforms.

which are more maneuverable and perceived to be more attractive by the general public. Other routes with high passenger volumes and heavy loading and unloading along the route (particularly at major transfer points) should have a floor lower to the road, and wide doors which open automatically. Figure 2 shows a standard German city bus which has these features.

Small vehicles operated in the flexible services for the disabled must have hydraulic ramps of enough structural stamina to lift the very heavy electronic wheelchairs many times every day.

In addition we propose to explore whether electric vehicles on any route might increase transit's acceptance in the City.

Marin Avenue should carry a transit line to meet east-west travel demands for hill residents. Unfortunately, no transit vehicle can safely negotiate the grades except for a cable car. Therefore, we will determine how much a cable car would cost for Marin Avenue, and what contribution it would make.

Finally, some routes, particularly the east-west variety, might lend themselves to operation by vehicles owned by the driver.

Taxis

In the proposals, taxis will continue to play an important role. The current taxi operation in Berkeley will be evaluated to determine

whether supply of service can be expanded and whether the cost brought down.

Fares

Regardless of which alternative is adopted, certain fare policies will be explored. These will be directed at encouraging payment on a basis other than by the ride and at reduced fares.

Parking and Roadway Policies

The usefulness to the community of any of the transit proposals would be enhanced by actions to locate major activities at only the more transit-accessible points, and to actively discourage automobile usage at the same time. Several policies will be explored in this regard.

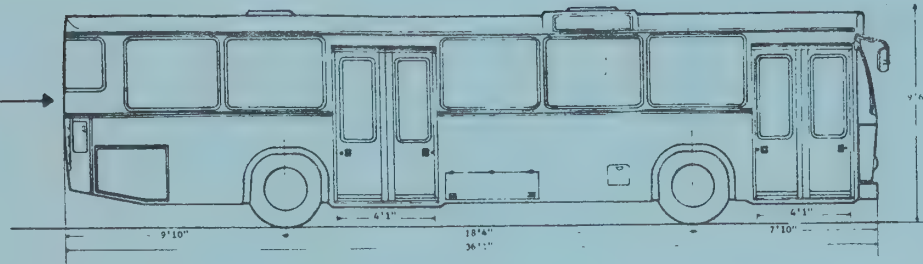
Shelters

All proposals require bus shelters, particularly at transfer points.

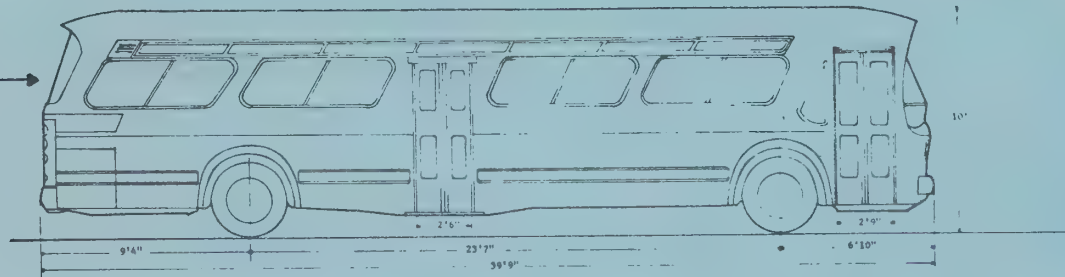
COMPARISON OF TRANSIT VEHICLES

FIGURE 2

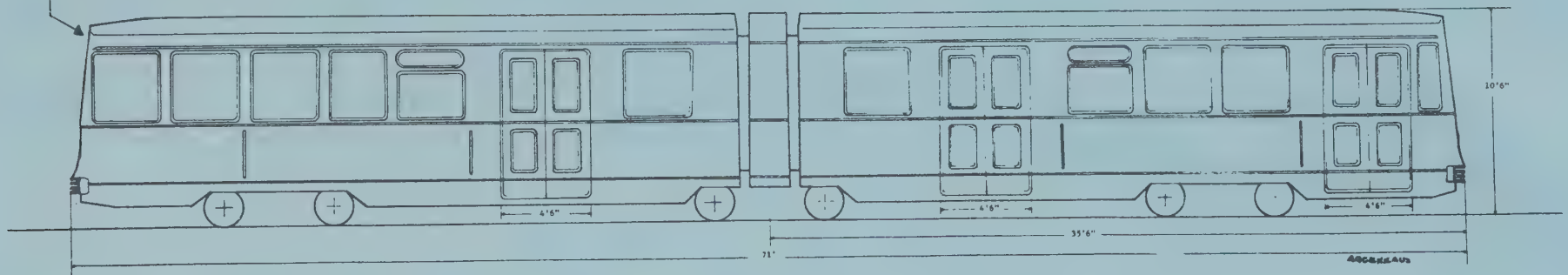
STANDARD
GERMAN
CITY BUS



STANDARD
AMERICAN
CITY BUS



NEW STREET CAR
FOR SAN FRANCISCO



INTRODUCTION

The Berkeley Transit Project will develop and recommend an action program to improve public transportation within Berkeley and elsewhere in the Bay Area.

The Project, one of nearly thirty studies being conducted for the Metropolitan Transportation Commission, is under the direction of the Berkeley Transit Coordination Board.

This Board is composed of representatives from the City of Berkeley, the Berkeley Unified School District, the University of California, A.C. Transit, BARTD, and the Metropolitan Transportation Commission. It is chaired by Mayor Warren Widener. Mr. Thomas F. Peak, Director of the Berkeley Planning Department, administers this project for the Board. Mr. Joseph Engbeck chairs a committee of Berkeley residents, who advise the Board.

This project is underway and description of work to be accomplished, the schedule and the project participants is contained in the "Work Program and Schedule" memorandum, dated April 2, 1974. Other information about the project can be obtained from:

Gregory Thompson, Project Coordinator
Berkeley Transit Project
2030 Milvia Street
Berkeley, California 94704
Telephone: 845-1865

REASONS FOR IMPROVING PUBLIC TRANSPORTATION SERVING BERKELEY

The Circulation Section of the Master Plan states that many Berkeleyans and visitors from the outside should be able to conveniently satisfy their travel desires by using transit. Today, that is not possible for most Berkeleyans, which is why transit should be improved.

Today, public transportation serving Berkeley can take people to downtown Oakland or downtown San Francisco without much trouble, and a large number of people going to those places use it. However, almost all people traveling around Berkeley and between outside points and Berkeley don't use transit, because the existing services aren't designed for this type of travel. For example, travel between many areas of Berkeley is very time-consuming by bus. Downtown Berkeley has inconvenient access from the southwest of Berkeley. Neighborhood commercial areas (such as Walnut Square, or Elmwood), Tilden Park, El Cerrito Shopping Center, the West Berkeley Industrial Area, some of the junior high campuses and the high school among other places where people like to travel are all difficult to get to by bus during most times of the day. Then, there is the University of California, which influences the City as much in regard to travel matters as in all other affairs. Transit service to this institution is relatively poor and has been for many years. Many Berkeleyans cannot easily reach this major destination by bus or train, although the recent introduction of the Humphrey-Go-BART shuttle bus is a major improvement.

It is just as hard for most people coming from outside Berkeley to get to these places using transit as it is for many people living inside Berkeley. As a result, most people who travel inside of Berkeley or who come into Berkeley from the outside do not use transit. Because people traveling within Berkeley or to Berkeley account for most travel in Berkeley, the existing transit system's impact upon the City is rather limited.

As it is now, people who can't drive must often either stay at home or depend on others. Many people who can drive do so from necessity, with no real alternative means of travel. They can't leave their car at home or get rid of it.

Public transportation for Berkeley that will take people where they want to go is important now, and will become much more important as the hassle and cost of driving increases in the future.

PERSPECTIVE ON BERKELEY'S TRANSIT DEFICIENCY

Public transportation systems generally take two approaches to service:

- 1) The first approach is to serve a large number of destinations well from all residential areas in a city;
- 2) The other approach is to serve just one destination or a very few very well from all residential areas in a city.

Transit systems which are socially and economically important to the communities which they serve are based on the first approach. Unfor-

tunately, most transit planning in the United States is based upon the second approach and the existing bus service in Berkeley is no exception. Even though these latter systems may capture a large proportion of the trips to the one place which they serve well, their impact upon the community as a whole is not very significant.

Because most Berkeley travel is within or coming to Berkeley, we strongly favor the first approach as the best way to increase the significance of transit to Berkeley. We believe that improving transit service to many destinations is a good approach for other communities as well. In fact, we have based the development of the proposals described here upon two fundamental conclusions regarding improvement to transit:

- 1) It's going to have to serve more than just work trips to Oakland and San Francisco and;
- 2) It's going to have serve local trips, made entirely within Berkeley, and for the longer-distance trips coming in from the outside.

TRANSIT IMPROVEMENT FOR BERKELEY

Transit improvement in Berkeley should occur on several fronts: route structure, vehicle design, transit vehicle preference and fare policy, to name several. However, the key to transit improvement is where and when the routes go, and how they relate to each other. It really doesn't matter if the bus or trolley is dirty or clean, is the proper design, or if it is free; if it does not first go where a person want to go (either

directly, or via a convenient transfer) when he wants to go, he won't use it. Once it does go where and when a person wants to go, then it is time to start worrying about the other things.

We have developed three proposals for improved transit routing in Berkeley. However, before describing these three routing proposals, we will describe the other aspects to transit improvement which should be common to each routing proposal.

Improvements Common to All Three Proposals

Several features would be common to all three proposals.

Special Service for Disabled

One of the most important new features would be a set of approximately 10 small buses with hydraulic ramps for the use by disabled per-

sons, both young and old. No matter how well a transit system is laid out, it cannot be used effectively by a person unless he or she has the ability to walk. Because it appears infeasible to load and unload wheelchairs from regularly-scheduled buses* which should not dwell longer than a few seconds at any given stop, the special service is proposed.

The 10 or more special small buses would have a central dispatching service. It would be set up to perform the following functions:

- . Receive requests directly from individuals requiring transport; coordinating referrals from Berkeley's social service agencies and taking reservations in advance for group travel (for example, transporting a group of senior citizens to a U.C. Berkeley evening event).
- . Schedule, route, and dispatch the service.
- . Provide service information and conduct marketing programs.
- . Provide system management.

The users of all City operated social services could be provided with the necessary transportation in a coordinated manner by this system.

*It is possible that principal transit routes receiving special treatment could accommodate wheelchairs between certain stops, if those routes were redeveloped into modern high-capacity streetcar lines with selective floor-level platforms.

Other social services and community groups receiving grants-in-aid from the City could be encouraged to provide information regarding clientele transportation needs and to use the special demand-responsive service as a condition of grant approval.

The special demand-responsive system would be available for use by people who are able to travel by other means only as a last priority.

A substantial effort will be needed to coordinate the various social service agencies and special group needs for the demand-responsive service. These coordination efforts would involve:

- . Developing a comprehensive picture of social service transportation requirements; identifying duplications or inefficiencies in individual agencies' provision of transportation services;
- . Establishing a program for inter-agency referrals through the central dispatch; and,
- . Procedures for discontinuance of individual agency provision of transportation and contract service by the demand-responsive system. For example, hospitals in Berkeley could contract for patient pick-ups and transfers.

Coordination could also involve an agreement between the Unified School District and the demand-responsive service whereby the specially equipped small buses are operated and maintained by the District, and possibly used

to transport disabled students during specified periods of the day.

Bicycle Access to Transit

Bicycle access to transit services should also be encouraged. We do not feel that bicycles should be placed on board buses, but bicycles might be carried in special trailers or rear-mounted racks on sections of routes which traverse geographic barriers, such as the Bay or the hills. To that end, we propose that one hill route be equipped to carry bicycles as so described. In addition, BART's usefulness should be increased if people could safely store bicycles at BART stations. This safe storage should be free to the user. Finally, BART should carry bicycles during off-peak hours, as the London subway system does.

Vehicles

Better buses are needed. Some routes on all of the proposals should have smaller vehicles which are more maneuverable and perceived to be more attractive by the general public. Other routes with high passenger volumes and heavy loading and unloading along the route (particularly at major transfer points) should have a floor lower to the road, and wide doors which open automatically. Figure 2 shows a standard German city bus which has these features. Both the front and rear door of this bus are more than four feet wide, about double the door width of the GM buses currently used in Berkeley and most other American cities. Use of the German style bus in Berkeley would make the loading and unloading of the pull-type grocery carts

much easier than can be currently done. It would also greatly speed up loading and unloading on the heavily utilized routes, such as College Avenue, where 15 to 30% of the trip time is now taken up just by loading and unloading passengers.

Small vehicles operated in flexible services for the disabled must have hydraulic ramps of enough structural stamina to lift the very heavy electric wheelchairs many times everyday. The bodies themselves must be able to withstand this severe stress in the day-in and day-out usage which they would receive. This means that we must try to find vehicles of greater durability than those currently available.

In addition, we propose to explore whether electric vehicles on a particular route might increase transit's acceptance in the City. For example, a modern streetcar as shown in Figure 2, together with traffic changes favoring transit, might be appropriate for the special transit treatment mentioned for main routes in Proposals 1B and 2. Because this type of vehicle is capable of loading passengers at both street level, and at floor-level platforms like BART, it is possible to adapt it for carrying wheelchairs between select stops where floor level platforms could be constructed.

From a location standpoint, Marin Avenue should carry a transit line to meet east-west travel demands for hill residents. Unfortunately, no transit vehicle can safely negotiate the Marin Avenue grades except for a cable car.

Therefore, we will determine how much a cable car would cost and what contribution such a facility might make for improved services to the North Berkeley hills.

The use of elephant trains appears advantageous on some shuttle services. It is currently against the law to carry passengers in trailers (elephant trains) on public streets. This legislation will be reviewed as to its intent, and if appropriate, amending legislation will be recommended.

Finally, some routes, particularly of the east-west variety, might lend themselves to operation by vehicles owned by the driver. This would be similar to a jitney operation. Driver-owned vehicles operating to fixed schedules, and jitneys will both be evaluated for certain applications.

Taxis

In the following proposals, taxis will continue to play an important role. The current taxi operations in Berkeley will be evaluated to determine whether the supply of service can be expanded and whether the cost brought down, particularly by such methods as the city covering the insurance requirements for cabs. The cost of the City's subsidy of taxi fares for the aged who are not physically disabled will also be considered, particularly for evenings.

Fares

Regardless of which alternative is adopted, certain fare policies will be explored:

1. Provide municipal and University employees including faculty with transit fare, or request a contract arrangement with A.C. whereby these employees would be provided "pass" service with the City and University paying lump sum fees:
2. Initiate the same contract-pass arrangement for U.C. Berkeley students and staff (This arrangement is now being studied by A.C. and the University Community Affairs Committee, where it is indicated that every student could be issued a \$2.50 monthly pass, yielding A.C. more revenue than it gets now);
3. Promote the validation of transit fares by merchants who do not validate parking, and require merchants who do validate parking to validate transit fares to the same monetary amount. Alternatively a dated transit discount slip could be issued by the bus driver allowing the rider discounts at participating businesses.
4. Offer regular and non-peak hour transit passes to Berkeley residents.
5. Provide for some type of family discount fares during evenings and on weekends to encourage family recreation travel.
6. Establish incentives for businesses to provide package delivery service.
7. Provide free transferring between local transit in Berkeley and BART (in both directions).

Parking and Roadway Policies

The usefulness to the community of any of the transit proposals would be enhanced by actions to locate major activities at only the more transit accessible points, and to actively discourage automobile useage at the same time.

Accordingly, the following will be evaluated for all three proposals:

1. Parking fees at BART lots, with the proceeds to be contributed to the financing of the free transfer between local buses and BART described above;
2. A sur-tax on parking lot revenues in Berkeley; a further increase in parking meter rates and parking fines.
3. Prohibition of non-resident parking in residential neighborhoods (such restrictions are currently illegal on the grounds of discrimination; these legal problems will have to be explored);
4. Revision of ordinances to exclude parking structures in certain zoning districts;
5. Initiation of traffic controls to discourage automobile traffic on neighborhood streets and to establish priorities for transit on both neighborhood and arterial streets. These controls would include:

- a. Diverters or closures on neighborhood streets;
 - b. Selective street improvements to facilitate transit vehicle access;
 - c. Transit-only lanes;
 - d. Signal Preemption by transit;
 - e. Local ordinances to make motorist yield to buses departing bus stops.
6. Location of new community facilities (libraries, day care centers, etc.) where served by public transportation.

Shelters

All proposals require bus shelters, particularly at transfer points. Shelters are most important at the timed transfer points of Proposal 2, and should also be included at all route intersections of Proposal 1B (grid).

Major shelters or stations for Concept 2 should be sized according to the number of routes serving the coordination point. In addition to transferring passengers, these shelters are needed to serve riders who wish to walk further in order to reach a stop with more frequent service and a larger number of routes going to a larger number of destinations. Shelters at major meet points might include seating, transit information, bicycle lockers, rider-oriented concessions, lighting, drivers washroom and other appropriate services. Additional transit supervisors might be assigned to the principal transfer centers, to make sure that buses do not leave early and to cope with late buses.

Routing Proposals

All of the preceding improvements are important for increasing transit usage in Berkeley. However, their effect will be limited if routing is not improved to allow people access to many different destinations.

We have developed three proposals for routing improvement in Berkeley. Proposals 1 and 2 draw upon established and successful methods for making many different destinations in Berkeley reasonably accessible by transit for Berkeley residents and people on the outside as well. Proposal 3 is an attempt to accomplish this basically different approach, but without major changes to the existing system.

General Routing Methods for Making Transit Serve a Large Number of Destinations During All of the Day

Before describing the three routing proposals, we will describe the established and successful routing methods upon which two of them are based.

At least three methods exist for making a large number of points reachable by transit:

- 1) Grid route orientation
- 2) Timed transfer point route orientation
- 3) Dial-A-Ride

These are contrasted to the primarily one destination radial method, which is used in this area. Figure 1 is a simplified schematic drawing illustrating the essential difference between the grid, timed transfer, and radial routing methods.

Descriptions of the three multi-destination methods follow:

Grid Orientation

A very straight-forward way for making transit serve many different destinations is to adopt a grid route structure. Every major north-south street would have a frequent bus or streetcar route on it, and so would every major east-west street. The advantage of this approach is that a person generally can get anywhere he wants to go within the area which has transit service by transferring at most just once. If all of the routes are frequent, the transfer is not objectionable. Furthermore, a person travels by bus between two points just as he would drive: For instance, by just going north on a major street, and then going west on another major street. This means that the system is not confusing to the person who is not a habitual user of transit.

Some American planners might argue that a grid system is not good because it requires almost everybody going downtown to transfer once. Their argument is that only people going downtown will ride transit, and even they will use transit only if they have a direct, no-transfer ride.

The fact that the no-transfer ride makes it difficult for everybody else to use transit is not important, the planners' argument continues, because people not going downtown wouldn't use the system anyway.

These criticisms may not be valid if the experience of Toronto is any indication. Toronto is the only area on the continent where grid transit planning extends over the entire metropolitan area. Interestingly, transit is used more extensively in Toronto than anywhere else. More than 25% of all trips in the entire metropolitan area are made on transit even though automobile ownership is high and there are no restrictions on auto usage. It is true that most people going downtown have to transfer, but this apparent disadvantage has benefited downtown-bound transit passengers. Because only two or three routes must receive all transfer passengers going downtown, these routes have been upgraded to extremely high quality. Transit in Toronto now carries 80% of all people going downtown during the rush hours, and 40% on an all-day basis. It appears that the full development of Toronto's transit system into one that serves multi-destinations throughout the metropolitan area ends up serving the downtown better than the typical American system which is designed to serve only the downtown. In addition, it serves a large number of other trips and is important to the entire community.

Coordinated Time Transfer System

Another way to make many destinations available by transit is to create a limited number of points on

a system where there are scheduled connections between all routes. Under the coordinated timed transfer approach, buses on different routes converge to a common point and then interchange passengers. While through passengers on a route are delayed several minutes, transferring passengers encounter only a minimal time loss. After interchanging passengers, the buses depart the transfer center along their respective routes. With several transfer centers in a community, all interconnected, a wide degree of mobility is available to public transit riders.

This approach does not make all places reachable by transit, as does a good grid system, but it does a lot better than the typical no-transfer radial system. This approach does particularly well if it is combined with good land use planning so that the many points made accessible by transit are the places where people want to go.

Transit riders will frequently walk further in order to board a bus at a transfer center, since transfer centers offer greater access to diverse destinations in the community. Pedestrian access to transfer centers should be improved to encourage this behavior. Generally, major trip destinations such as downtown areas, rapid transit stations, shopping centers and universities are selected as transfer locations.

Principal advantages of the timed transfer approach include reduced transfer times and also opportunity for controlled environment (i.e. security and weather) for transfer. Principal disadvantages include slower thru service on a

single route, more frequent boarding and disembarking and platooning of buses running along the same street. The latter occurs when two routes operate on the same street segment near a timed transfer point.

Experience in other cities with timed transfer service has generally been favorable. The coordinated timed transfer is a central transit planning principle used in the Netherlands, where public transport is able to meet the travel demands of most people. Transit patronage in Edmonton, Canada (430,000 population) has increased more than 25 percent since adoption of the timed transfer approach in 1962. Previously Edmonton's transit usage had been declining.

Dial-A-Bus

Another method in making many destinations available is not to use fixed routes, but to use small buses which will go to where people want to go. Dial-A-Bus is a flexibly-routed bus concept, essentially like a group taxi. A person phones in a request for service and a small bus or van is dispatched to his/her door. It then goes to the desired destination, making occasional deviations from the route to pick up other passengers who may have phoned in and are going more or less the same way. Naturally, planners don't have to worry about route orientation, because this type of system takes people wherever they may wish to go.

Dial-A-Bus dispatching technology is not sufficiently advanced to allow control of more than 18 vehicles in one area. (More advanced computer dispatching is currently being tested on the Federally-sponsored

demonstration dial-a-ride project in Haddonfield New Jersey, but has not been proven.) A city using more than 18 Dial-A-Buses would have to divide itself into Dial-A-Bus service areas (or cells). Dial-A-Bus service cells have been proposed for Santa Clara County, which intends to install a very large Dial-A-Bus service. Unfortunately, travel between Dial-A-Bus service cells is generally inconvenient.

Application to Berkeley

These routing methods are used in the routing proposals for Berkeley. Proposal 1 uses both Dial-A-Bus and grid routing methods. Proposal 2 uses the timed transfer point method. Proposal 3 is an improvement upon the existing radial system.

Proposal 1

Proposal 1 makes many different destinations reachable by setting up a system of dial-a-ride services which would take Berkeley residents around for local trips. About 50 dial-a-ride buses would connect with major A.C. Transit bus routes on each north-south arterial, as well as with BART stations in order to provide connections to and from regional transit services.

Several features of Dial-A-Bus operation make it seem advisable to also evaluate the application of the 50 Dial-A-Buses in other ways that would carry more passengers. Dial-A-Buses running at random on all neighborhood streets might be unwelcome neighborhood intrusions. The diverters proposed in the Neighborhood Traffic Study could hinder Dial-A-Bus operation and would have to include moving

arms to allow Dial-A-Buses to pass through, and while it is feasible to install such arms on some diverters, installing them on all diverters might be too costly. Dial-A-Buses could not operate freely throughout Berkeley but would have to be confined to one of four areas in the City. Traveling from one area to another would be difficult for a passenger. Most important, however, is the fact that 50 small buses in a dial-a-ride operation could accommodate only about 5,000 passengers a day. Using these buses in other ways, we should be able at least to triple this number.

We will, therefore, also consider in Proposal 1 running the 50 buses originally intended for dial-a-ride instead on the north-south streets to supplement the frequency of A.C. Transit long-distance buses, and on all major and some minor east-west streets. This change would result in a system of buses and mini buses for Berkeley running on a grid pattern of routes. Service would be at least every 10 minutes. Some routes serving areas of concentrated activity, most notably the University, would have to receive special attention to increase their attractiveness and ability to absorb large passenger volumes without causing the level of service to deteriorate. That would mean special emphasis placed upon vehicle type and the treatment to the roads along which these particular routes traveled.

Other routes, running on minor east-west streets and in the hills, would require equal attention devoted to vehicle types, as well as attention to traffic devices which would discourage through automobile travel on the street, if it is not now

proposal 1A

MAJOR NORTH-SOUTH TRANSIT
ROUTES OPERATED IN
CONJUNCTION WITH DIAL-A-RIDE

LOCAL BUS ROUTE ———
SPECIAL TREATMENT
TRANSIT ROUTES
BUS LINE NUMBER 7
END OF LINE (8)
DIAL-A-RIDE ZONE I

0 0.25 0.5 0.75 MILE



FIG. 3A

proposal 1B

MAJOR NORTH-SOUTH TRANSIT
ROUTES OPERATED IN
CONJUNCTION WITH
EAST-WEST SHUTTLES

LOCAL BUS ROUTE ———
SPECIAL TREATMENT
TRANSIT ROUTES
BUS LINE NUMBER 7
END OF LINE (8)
EAST-WEST SHUTTLES

0 0.25 0.5 0.75 MILE



FIG. 3B

carrying through automobile traffic.

Proposal 1, therefore, originally borrowing from the dial-a-ride method, will likely also include a grid orientation of routes when it is evaluated. The result may be a day-time grid operation, and evening dial-a-ride operation. Figure 3 shows the routes for this proposal.

Proposal 2

Proposal 2 is an application of the timed-transfer method. Basic all-day headways on most routes would be a bus every 15 minutes, and in some cases every 7 1/2 minutes. Existing A.C. Transit routes would be reoriented so that there would be continuous north-south routes on major streets from one end of Berkeley to the other: on 6th Street; San Pablo (as at present); Sacramento/Santa Fe; Grove/the Alameda/Colusa; Shattuck/the Arlington; and Telegraph/Euclid. (The College Avenue route would continue to be diverted down University Avenue, as at present). In addition, east-west service would be improved. Service on Ashby would be more frequent. Service on Dwight west of Shattuck would be discontinued, but would be replaced by new frequent services on Derby and Bancroft which would reduce the maximum walking distance to east/west bus routes. (The Derby service would be put in with one or more traffic diverters having a movable arm, so as not to encourage through automobile traffic.) New service would go in on Cedar.

The main feature of Proposal 2 is that these routes would in some places make detours to intersect each other at timed transfer points, where scheduled

transfers could be made between most or all routes, depending upon the particular transfer point. Efforts have been made to locate the principal transfer points at locations which are themselves important local destinations in Berkeley. These points are either district shopping centers or BART stations.

University and San Pablo
North Berkeley BART Station
Ashby BART Station (with most
buses serving the South Berkeley
commercial area as well.)
Solono and the Alameda

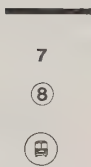
Downtown Berkeley will also be a major timed transfer point if the problems of accommodating up to 15 buses meeting at one point can be worked out.

Proposal 2 has been designed to allow almost all Berkeley residents to have a direct ride, or a ride with a maximum of one timed transfer* to the following locations:

North Campus, U.C.
South Campus, U.C.
Downtown Berkeley
W. Berkeley Industrial Area
Berkeley Marina
King Junior High

*People in a few small areas would have to make two timed transfers in order to reach some of the points listed above.

LOCAL BUS ROUTE
BUS LINE NUMBER
END OF LINE
COORDINATED TIME TRANSFER



Willard Junior High
 West Campus, Berkeley High
 Main Campus, Berkeley High
 El Cerrito Plaza Shopping Center
 Solono Shopping Center
 Walnut Square Shopping Center
 West Berkeley Shopping Area at
 University & San Pablo
 South Berkeley Shopping Center
 Elmwood Shopping Center
 Hotel Claremont

In addition, people living elsewhere could get to these places with a direct ride from BART or timed connections with buses from the Warren Freeway corridor and the various routes from downtown Oakland.

Again, the major routes serving the University such as the College and University Avenue routes, and the transit access along Bancroft will receive special emphasis in regard to vehicle design and right-of-way treatment. This will be done in recognition of the huge volume of transit passengers which the University should attract, and the necessity of providing high capacity and moderate speeds along certain routes leading to the University.

Proposal 3

Proposal 3 is less dramatic in that it generally preserves the existing A.C. Transit route structure within Berkeley, but makes some specific improvements to it including making all half-hour routes 15 minutes between buses. It also adds some special shuttle buses (such as the Humphrey Go-BART, which just began operation)

to complement and increase the usefulness of the A.C. Transit services.

Changes to A.C. Transit's route structure include combining routes coming into the south of Berkeley with routes coming from the north to provide continuous north-south routes through the City (except for the College Avenue route, which continues to run down University Avenue). Another change is to reduce the time between buses to 15 minutes on all routes where it is now 30 minutes. A new east-west service is proposed for Cedar, and some of the currently minor routes are changed as to where they go.

In addition, several shuttle buses are suggested to fill in some gaps not covered by the above route system. Shuttle service (Humphrey Go-BART) must continue to be provided from downtown Berkeley into the campus in order to make many of the longer distance bus routes serve as campus access. An elephant train shuttle allowing any boarding and alighting is proposed for Shattuck Avenue, so that people who take the bus or BART downtown have a convenient means to go from one store to another which is at some distance. A shuttle loop from the hills is proposed so that many hill residents can get to both North Berkeley shopping areas. In addition, special bus service is proposed from north of Richmond to the West Berkeley Industrial area, and University Village continues to be linked to the University by a shuttle, which continues to the Radiation Laboratory.

proposal 3

MODIFIED AC SERVICE WITH
COMPLEMENTARY SHUTTLES

LOCAL BUS ROUTE
SHUTTLE SERVICE
BUS LINE NUMBER
END OF LINE

0 0.25 0.5 0.75 MILE



FIG. 5

EFFECTS OF PROPOSED BERKELEY CHANGES ON
TRANSIT SERVICE OUTSIDE OF BERKELEY

Most regular bus routes currently serving Berkeley begin in Oakland, and five of these (72, 43, 43A F, 51A) continue through Berkeley into Albany and beyond. In addition, some local bus routes which begin in Berkeley continue into Albany or Kensington. All of the proposals which we have put forward alter these routes within Berkeley (with the exception of the 72 San Pablo, which is not changed). These changes to bus service within Berkeley may raise questions as to the effects upon bus service outside of Berkeley.

In putting together the proposals, we used an objective of not adversely interfering with transit trips made entirely within Oakland or Albany or other cities outside of Berkeley. As a consequence, all of the proposed bus routes leaving Berkeley and going into Oakland and Albany operate on the same streets and with the same headways as the current ones do.

We have suggested that several routes from Berkeley which now operate through downtown Oakland to San Leandro or Alameda be broken into separate routes between Berkeley and Oakland, and Oakland and San Leandro or Alameda, as the case may be. We have made these suggestions in order to:

- 1) Improve schedule reliability on Berkeley service.
- 2) Enable more Berkeley routes to terminate in the vicinity of Jack London Square which a number of Berkeley residents have requested.

We at this point feel that the suggestion would not hurt service outside of Berkeley. It appears that the current through-routing schemes are done for operating convenience, rather than for improving service to the customer, as the magnitude of through patronage appears to be small (particularly since BARTD). Furthermore, if long through-routes are broken in Oakland, improved schedule reliability should benefit residents of East Oakland, San Leandro, and Alameda, as well as those of Berkeley. As a consequence, we feel that this suggestion would not result in local service deterioration in Oakland or other cities outside of Berkeley. It would cost more to operate, and these increased costs, if the changes are recommended, would have to be a part of the financial package for any changes proposed for Berkeley. It would, furthermore, require the endorsement of Oakland officials. Evaluation will have to include all of these factors.

In Albany, we have proposed that bus service remain essentially the same as it is now, with the exception of a proposed extension of the Portland Avenue route to El Cerrito Plaza, and the suggested introduction of a new route west of Albany Hill. Such proposed changes would appear beneficial to Albany, although they would require the concurrence of Albany officials.

It is likely that all proposals would alter transit travel patterns between all outside points and Berkeley. We put the proposals together in such a way that we thought such alterations would be beneficial, resulting in greatly increased usage of transit between outside points and Berkeley. Evaluation will attempt to determine whether these objectives would be realized.

INVITATION FOR RESPONSE

The three proposals just described will now be evaluated primarily by the consulting teams made up of Wilbur Smith and Associates and Curtis Associates. Evaluation will include determination as to how much each proposal would cost, the type and amount of travel it would attract, its probable influence on transit operation outside of Berkeley, probable impact on pollution, and other factors. We realize that many people may not wish to comment on one proposal in relation to the other until these types of data are at hand. However, if

you feel we have omitted something, are taking the wrong approach, or if you have other comments, suggestions or criticisms, we would like to hear from you:

- ☐ I would like to attend a meeting where the proposals are being presented.
- ☐ I will help organize a meeting in my neighborhood where the proposals can be discussed.
- ☐ I would like to learn more about the proposals for improving transit in Berkeley.

Comments, suggestions and criticisms:

MAIL TO: Greg Thompson
Berkeley Transit Project
2030 Milvia St.
Berkeley, Calif. 94704

Name _____ PHONE _____

Address _____

_____ Zip _____



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